



## **Environmental magnetism of Portuguese speleothems**

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Environmental magnetism of speleothems is still in its early stage of development. Here we studied two speleothems from the Algarve region (Portugal) by using a multidisciplinary approach, including rock magnetism and geosciences tools, in order to discuss what are the factors that control the preservation and reliability of the magnetic remanence, and what are the environmental information that speleothem recorded. Our results show that the main magnetic carriers of the speleothems under study are primary (detrital) and consist of maghemite (and magnetite?) and hence, they represent a regional environmental signature. Interestingly, a stable and probably detrital remanent magnetization could be isolated in the fresh stalagmite, whereas the weathered stalactite yielded chaotic magnetic directions and very low remanent intensities. We suggest that these low intensities can be the result of different remanence acquisition mechanisms between stalagmite and stalactite and/or iron dissolution by fungal activity. Finally, we discuss the relation between magnetic properties and environmental proxies and their implications for high-resolution climate reconstructions.

Keywords: speleothem, magnetism, environment, SEM, fungi, Portugal.

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